PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS IN NEWLY DIAGNOSED BREAST CANCER PATIENTS TREATED AT OCEAN ROAD CANCER INSTITUTE

Queen Godfrey Tarimo, (MD)

Master of Medicine (Clinical Oncology) Dissertation
Muhimbili University of Health and Allied Sciences.
October, 2024

Muhimbili University of Health and Allied Sciences

Department of Clinical Oncology

PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS IN NEWLY DIAGNOSED BREAST CANCER PATIENTS TREATED AT OCEAN ROAD CANCER INSTITUTE

By

Queen Godfrey Tarimo

A Dissertation Submitted in Partial Fulfillment of the Requirement for the Degree of Masters of Medicine in Clinical Oncology of the Muhimbili University of Health and Allied Sciences

October, 2024

CERTIFICATION

The undersigned certifies that they have read and hereby recommend for "***acceptance by the Muhimbili University of Health and Allied Sciences, this research project entitled*** **PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS IN NEWLY DIAGNOSED BREAST CANCER PATIENTS AT OCEAN ROAD CANCER INSTITUTE",** in (Partial) fulfillment of the requirements for the degree of Masters of Medicine in Clinical Oncology of the Muhimbili University of Health and Allied Sciences.

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Dr. Nazima Dharsee

(Supervisor)

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Date:

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Dr. Christina Vallen Malichewe

(Co-Supervisor)

_____

Date:

DECLARATION AND COPYRIGHT

I, **Queen Godfrey Tarimo**, hereby declare that this research project is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

Signature..... **Date**: .....

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ACKNOWLEDGEMENTS

I would like to express my sincerest gratitude to my supervisor, Dr. Nazima Dharsee, for her dedication and guidance from proposal development to the final write-up. I would also like to thank my co-supervisors, Dr. Christina Vallen Malichewe and Professor Christine Miaskowski, for their continuous support, mentorship, and critical input throughout the entire process. Special thanks to the entire clinical oncology department academic staff for their guidance and mentorship. I am grateful to MUHAS IRB and Ocean Road Cancer Institute for their unwavering support.

Special thanks to the patients for willingly participating in this study and for sharing their experiences. I would also like to extend my deepest gratitude to my beloved family, whose unwavering love and encouragement have been my cornerstone. To my fiancé, Andrew Julius, your steadfast support, patience, and belief in me throughout this journey has been immeasurable. I am eternally grateful for your presence by my side. To my friends, thank you for your unconditional love, understanding, and encouragement, which have been vital in seeing me through to the completion of this work.

And to the Almighty God, who has brought me this far: May your grace and affection continue to follow me throughout the rest of my life

DEDICATION

This work is dedicated to my late parents, Mr. and Mrs. Godfrey Tarimo, whose love and guidance continue to inspire me every day. To my family for their unwavering support, To my friends for their prayers and constant motivation.

ABSTRACT

Background: Depression is a common condition that affects patients with cancer. However, compared to other cancers, breast cancer is associated with higher rates of depression. The prevalence of depression has detrimental effects on patients' quality of life, adherence to treatment, and survival. Known risk factors for depression include: a lower level of education, more invasive surgery, a higher stage of the disease, and decreases in social support. Very few studies have evaluated the prevalence, severity, and risk factors for depression among breast cancer patients in Africa, and even fewer studies in Tanzania. Therefore, this study aimed at helping clinicians' assessment and treatment of depression in patients with breast cancer.

Objective: The study aimed to determine the prevalence of depression and associated factors among newly diagnosed breast cancer patients receiving treatment at the Ocean Road Cancer Institute in Dar es Salaam.

Methodology: This was a hospital-based cross-sectional study involving women diagnosed with breast cancer in the year 2023. The study was conducted from December 2023 to March 2024 and collected information on independent variables including socio-demographic, clinical, and treatment factors. The dependent variables were the prevalence and severity of depression which were assessed using the Patient Health Questionnaire (PHQ-9). The Statistical Package for the Social Sciences (SPSS, version 26) was used for data entry and analysis. Both univariate and multivariate analyses were used to determine the relationship between independent and dependent variables.

Results: A total of 197 breast cancer patients were recruited. The mean age of participants was 50.4 years and all participants were females. Depression was found in (108 cases) that is 54.8% of the study participants. Among 108 patients with depression, 40% had mild depression, 11% had moderate depression, and 4% had moderately severe depression. Depression was significantly associated with younger age <45years (OR= 2.65 P=0.021 95% CI (1.16-6.06)), advanced stage of the disease (OR=3.44 P=0.001 95% CI (1.17-10.10), not having received surgery (OR=6.11 P=0.001 95% CI (2.76-13.56)), not having received

radiation (OR=2.35 P=0.044 CI (1.50-6.77)), being HIV positive (OR=10.17 P=0.001 95% CI (2.49-41.63)) and presence of pain (OR=2.81 P=0.004 95% CI (1.40-5.65)).

Conclusion: This study has demonstrated that the prevalence of depression is high in newly diagnosed breast cancer patients. Factors that were significantly associated with depression were the younger age of patients, advanced stage of disease, not receiving surgery, not receiving radiotherapy, being HIV positive, and the presence of pain. It is, therefore, essential to emphasize the multidisciplinary management of cancer patients and to build strong collaboration with psychiatrists and the palliative care team. This will allow ease of consultation, referral, and timely and efficient management of these patients.

Keywords: Breast cancer, Depression, Prevalence, Risk factors, Patient Health Questionnaire (PHQ-9), Tanzania.

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LIST OF ABBREVIATIONS

BCS	Breast-Conserving Surgery
CI	Confidence Interval
ECOG	Eastern Cooperative Oncology Group
HIV	Human Immunodeficiency Virus
MRM	Modified Radical Mastectomy
MUHAS	Muhimbili University of Health and Allied Sciences
ORCI	Ocean Road Cancer Institute
OR	Odds Ratio
PHQ-9	Patient Health Questionnaire-9
SD	Standard Deviation
SPSS	Statistical Package for the Social Science

DEFINITION OF TERMS

Depression is a medical illness that negatively affects how you feel, the way you think, and how you act. It is characterized by persistent sadness and lack of interest or pleasure in previously rewarding or enjoyable activities.

Newly diagnosed breast cancer: Patients with breast cancer with confirmed histology diagnosed within one year.

Severity of depression: Depression is classified based on severity ranging from mild to moderate to severe. It is determined by the number and intensity of symptoms, impact of daily functioning, and duration of depressive episodes.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Breast cancer is one of the most common types of cancer and the leading cause of death among females in the world. One in eight women will be diagnosed with breast cancer in their lifetime (1)(2). In sub-Saharan Africa, while the prevalence of breast cancer is relatively low, the mortality rate is high. In the Globocan 2020 report (2), in Tanzania, the incidence of breast cancer was 9.9% and the mortality rate was 7.3%.

Depression is a common symptom that affects more than 10% of patients with cancer (3). While non-pathological sadness may be a normal response to a cancer diagnosis, unrelieved stress that exceeds patients' coping mechanisms may result in a major depressive disorder (3). Compared to other types of cancer, women who have breast cancer can have more severe emotional and psychological effects that range from mild mood changes to severe depression (4). The occurrence of depression has negative consequences on the living standards of the patients; can decrease adherence to treatments; and decreases survival. Evidence suggests that women are at increased risk for developing depression within the first year after their cancer diagnosis (5). For example, in one longitudinal study (6), depressive symptoms tended to be higher immediately after the diagnosis than at all other times. The authors suggested that the diagnosis of cancer represented a meaningful moment with a specific impact on an individual in terms of its emotional consequences and potential disturbances in life balance (6). Common risk factors for depression included: a lower level of education, receipt of chemotherapy, having a mastectomy, and lack of social support and/or psychological support programs (5).

Depression is under recognized and under-diagnosed in clinical practice. Untreated depression has significant negative consequences including altered treatment decision-making, decreased adherence to treatment, extended hospitalizations, and increased intensity of pain (7,8). In addition, regardless of whether patients do or do not have a history of mental illness, psychosocial care is often overlooked during cancer treatment. Earlier detection and treatment of depression may improve clinical outcomes in patients with breast cancer (9).

Most high-income countries have integrated psycho-oncology into cancer care using a multidisciplinary approach to prevent and manage psychological issues. However, in most low-income countries, these services are not available (10). This gap in care may be related to the paucity of research on depression. Therefore, this study's overall goal is to determine the prevalence of depression among newly diagnosed breast cancer patients and identify risk factors associated with depression.

1.2 Problem statement

Breast cancer diagnosis and associated treatments are traumatic experiences for most women because of their impact on self-image and the loss of femininity due to surgery, radiation therapy, and/or chemotherapy. As a result, most patients with breast cancer experience psychological reactions to the diagnosis and associated treatments (1). The physical burden of the illness and associated psychological reactions can lead to decreases in social acceptance and may result in poorer treatment outcomes (11).

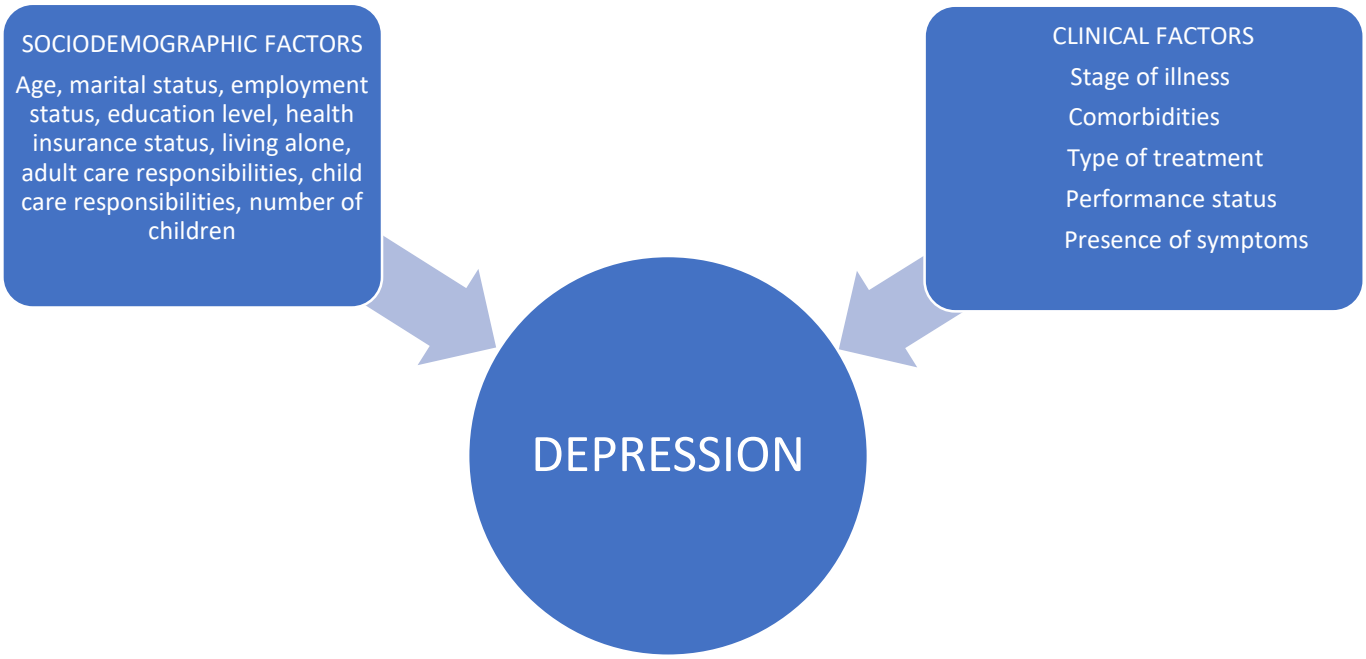
High levels of depression in breast cancer patients interfere with their ability to cope with the burden of disease ((11)(12). In addition, depression decreases patients' acceptance of treatment, may extend time in the hospital, and results in a decline in life quality. Important to note, depression may make people more likely to commit suicide (12,13). In addition, in a study of depression as a predictor of mortality at 5 and 10 years after a breast cancer diagnosis (14), a significant positive association was found between depression and mortality.

Despite the knowledge that patients with breast cancer are at increased risk for depression, there is scarce data on the prevalence and associated risk factors for depression in these patients in Tanzania. Therefore, the purpose of this study was to fill this gap in knowledge.

Specifically, this study's goal was to determine the prevalence of depression and its associated risk factors among newly diagnosed breast cancer patients being treated at Ocean Road Cancer Institute.

1.3 Conceptual framework

The figure below describes the association between potential socio-demographics and the clinical risk factors for depression.



1.4 Rationale

The study aimed to determine the prevalence of depression and its associated risk factors among patients who have been newly diagnosed with breast cancer at Ocean Road Cancer Institute. This knowledge of the magnitude of depression and its associated risk factors will result in increases in its diagnosis and effective management (15).

Identifying the prevalence of depression in breast cancer patients can inform the development of screening programs that integrate depression assessment into routine clinic workflows. This will improve the timely identification and management of depression, reducing the burden on patients, and families and improving their overall quality of life. Additionally, our findings highlight the need for targeted support for vulnerable groups commonly affected with higher rates of depression. Furthermore, our results support the need for psycho-oncologists to improve the early detection of depression and the initiation of targeted interventions to support patients' mental health (e.g., counseling, and support groups).

1.5 Research questions

1.5.1 General research question

What is the prevalence of depression and its associated risk factors in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute?

1.5.2 Specific Research Questions

1. What is the prevalence of depression in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute?
2. What is the severity of depression in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute?
3. What are the socio-demographic factors associated with higher depression scores in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute?
4. What are the clinical risk factors associated with higher depression scores in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute?

1.6 Objectives

1.6.1Broad Objective

To determine the prevalence and severity of depression and associated risk factors in newly diagnosed breast cancer patients.

1.6.2 Specific Objectives

1. To determine the prevalence of depression in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute who were assessed between December 2023 and March 2024.
2. To determine the severity of depression in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute who were assessed between December 2023 and March 2024.
3. To determine the sociodemographic factors associated with higher depression scores in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute who were assessed between December 2023 and March 2024.

4. To determine the clinical risk factors associated with higher depression scores in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute who were assessed between December 2023 and March 2024.

1.7 Literature review

1.7.1Prevalence of depression

Depression is a common symptom that can substantially cause an effect on the quality and patient's social life (16). Depression is a more prevalent condition among those patients with chronic illnesses than in healthy populations. The overall prevalence of depression among cancer patients ranges from 0% to 58% (16). This wide range in prevalence rates may be due to the use of different diagnostic criteria for depression, the use of different measures to assess depression, and/or differences in the timing of the assessments across the continuum of cancer care ((16).

Oncology patients have a 3.4 increased risk of developing depression than the general population (17). As noted in one review (16), depression was more common in cancer patients from underdeveloped countries and women with a cancer diagnosis. Depression is twice as common in the first year following a cancer diagnosis as it is in the general population (18). The diagnosis of breast cancer and subsequent treatments are stressful times for some women. However, a subset of women who experience clinically significant depression may benefit from specialized psychiatric interventions (7). Depression and physical health are in a complex reciprocal relationship (6). While depression is often underdiagnosed and under-treated in breast cancer patients, these patients are more likely than those with other forms of cancer to experience it. In one review (4), 11% of newly diagnosed breast cancer patients experienced depression. In addition, depression during the first year of the diagnosis is common because of the emotional impact of the diagnosis, as well as subsequent surgery, chemotherapy, and/or radiotherapy (19). Prevalence rates for depression in breast cancer patients appear to vary across geographic regions. For example, in a study of Iranian women with breast cancer (20), 42.3% of them had moderate to severe depression while the prevalence of depression among breast cancer patients conducted in India was 21.5% (15). Also, in another study conducted in Rwanda, the prevalence of depression among cancer patients was found to be 67.7% (10). A systemic review and meta-

analysis in the sub Saharan Africa found that prevalence of depression among breast cancer patients was found to be 45.6% (21).In another study done in Morocco, the prevalence of depression was found to be 26% (22). These discrepancies could be explained by differences in countries' income levels, which may lead to delays in accessing care and receiving early diagnosis (21). Additionally, in comparison to higher income countries, a lack of awareness and knowledge about breast cancer symptoms may contribute to delays in symptom recognition and timely treatment (21)

Within the context of different types of breast cancer treatments, the chronicity of the condition, the occurrence of multiple co-occurring symptoms; fears of recurrence and death, financial challenges, and family concerns, depression can have untoward effects on women's occupational performance, social relationships, and the standard of living (20)(23). Moreover, unrelieved depression is associated with an increased risk of cancer progression and mortality (24).

Data are limited on the number of those who are newly diagnosed with breast cancer who experience depression in Africa and Tanzania. In studies conducted in Ethiopia (25) and Rwanda (10), the prevalence of depression was 58.4% and 67.7% respectively. However, the exact proportion of depression among those who have just been diagnosed with breast cancer in Tanzania is not known.

1.7.2 Severity of depression

Despite improvements in early detection and management, compared to other chronic conditions, women continue to experience more distress following a breast cancer diagnosis, regardless of its prognosis (26). Cancer remains one of the most feared illnesses. Its diagnosis has a huge psychological impact on patients and their family caregivers (13). The nature of this distress can range from mild to severe forms of depression. These patients may experience depression at any stage of their illness from pre-diagnosis to its terminal phases (26). The severity of depression varies among different populations and can range from mild to severe (11).

In a study conducted in Jordan (27), the prevalence of depression in patients with breast cancer was 30.2%. In terms of severity, 26% had mild symptoms, 19.5% had moderate, and 1.8% had severe levels of depression. In another study of breast cancer patients in Malaysia

(15), 6% had mild, 7% had moderate, and 8% had moderately severe to severe levels of depression. In a study of women with breast cancer in Iran (4), the prevalence of severe depression was 11%. These inconsistent prevalence rates for severe depression may be related to the measures used to assess depression and associated scoring procedures; as well as differences in the inclusion and exclusion criteria across studies (e.g., marital status, stage of disease), in the timing of the assessments across the continuum of cancer care; and/or cultural differences (20)(4). In addition, differences in the severity of depression may be related to variations in the adverse effects of treatment (e.g., changes in body image, associated with mastectomy, chemotherapy-induced hair loss) experienced by these patients (27).

In Africa, a paucity of research exists on the severity of depression in women with breast cancer. Therefore, a need exists to evaluate the occurrence and severity of depression in these patients. This study's goal is to determine the prevalence and severity of depression among newly diagnosed breast cancer patients in Tanzania.

1.7.3Risk factors for depression

1.7.3.1Socio-demographic factors associated with depression in breast cancer patients

The identification of demographic risk factors associated with depression in breast cancer patients will enable clinicians to identify high-risk patients and initiate tailored interventions. Increased depression prevalence rates are linked to a wide range of socio-demographic factors including age, marital status, and educational level (13)(18)(19).

In terms of age, in a study conducted in Malaysia, younger patients revealed higher degrees of depression. According to the author, this association could be due to the possibility of younger women's fears of early death and not being able to accomplish life goals. In addition, younger patients were less likely to expect to have a chronic illness ((28). In another study conducted in Palestine (5), compared to older women, 10% to 32% of younger patients who are diagnosed with breast cancer develop depression more frequently. In a study conducted in Morocco, a significant correlation was found between patients aged 20 and 40 years, while no patient above 60 years showed signs of depression (22). Marital status is another risk factor that was evaluated across studies because it may reflect social support provided by a partner (19). However, in two studies (26)(29), compared to single patients

with breast cancer, women who were married or partnered had higher prevalence rates of depression. The authors suggested that because these women had family care responsibilities their levels of anxiety and depression increased (26,29). In addition, living alone or being separated was associated with higher rates of depression. Equally important, the lack of family support contributes to higher rates of depression in women with breast cancer (11).

For patients with breast cancer in Kazakhstan (30), unemployed women were three times more likely than employed women to experience moderate to severe depression. Also, the proportion of retired depressed patients was twice as high as that of employed women (30). Equally important, women who had the lowest income were more likely to have moderate or severe depression. Lower economic status and higher treatment expenses were directly associated with an increased risk for depression (26). Specific risk factors included: expenses associated with traveling to the hospital for treatment; costs of fuel and accommodation; and the costs of meals for family or friends who accompanied the patient to the hospital or clinic (26).

In a study conducted in Northwest Ethiopia (25), patients with a lower level of education had higher levels of depressive symptoms than patients with a higher level of education. In another study conducted in Ethiopia (13), patients who had no formal education were more likely to develop depression compared to women who had a primary education. In the general population (31), the responsibility of caring for young children is a risk factor for depression. However, in a study conducted among patients with breast cancer in Sri Lanka (31), no association was found between the number of children and the occurrence of depression ((31).

1.7.3.2 Clinical factors associated with depression in breast cancer patients

Clinical risk factors associated with depression include the stage of the cancer, the presence of metastasis, and types of cancer treatment (28). For example, in a study conducted in Kazakhstan (30), patients with stage III breast cancer had moderate and severe depression symptoms compared to those with stages I and II ((30). Metastatic breast cancer has a poorer prognosis and its 5-year survival rate can be as low as 26%. Patients with distant metastasis have a higher symptom burden and stress that is attributable to chronic inflammation. These physiological effects may increase the occurrence of depression ((31). However, in another

study (26), the prevalence rates for depression were the same in patients with early and advanced-stage breast cancer. The authors suggested that the stress of the diagnosis was more relevant than the stage of that disease (26). In addition, in this study (26), compared to patients who did not undergo surgery, those who did had higher rates of depressive symptoms. In addition, patients who had a partial or total mastectomy were more likely to report moderate to severe levels of depressive symptoms (5). Also, breast cancer patients who experience a higher symptom burden tend to be more susceptible to depression, including patients who present with pain (32)

Currently, very limited information is available regarding the relationship, between clinical risk factors and the prevalence and/or severity of depression in patients with breast cancer in Africa. In a study in Ethiopia (25), higher rates of depression were reported by patients who were treated with chemotherapy compared to other forms of treatment. The authors suggested that these findings were attributed to the toxicities and side effects of these drugs (25). In a study conducted in Rwanda (10), similar associations were reported between the receipt of chemotherapy and more severe levels of depressive symptoms (10). Of note, no data are available on clinical risk factors associated with the prevalence and/or severity of depression in patients with breast cancer in Tanzania.

CHAPTER TWO

2.0 MATERIALS AND METHODS

2.1 Study design

A cross-sectional observational study design was conducted between December 2023 and March 2024 among newly diagnosed breast cancer patients being treated at Ocean Road Cancer Institute.

2.2 Study site

This study was carried out at Ocean Road Cancer Institute (ORCI). Ocean Road Cancer Institute (ORCI) is in Ilala District in Dar es Salaam, Tanzania. It is a national cancer referral hospital that cares for patients from all parts of Tanzania and neighboring African countries (e.g., Malawi, and Zambia). More than 550 breast patients are seen at Ocean Road Cancer Institute annually. Treatment modalities offered for breast cancer patients include chemotherapy and radiotherapy with either curative or palliative intent. The facility has two linear accelerators, two cobalt machines, one computerized tomography simulator, and a nuclear medicine department.

2.3 Study population

All breast cancer patients who are $\geq$18 years of age who were treated at Ocean Road Cancer Institute and consented to participate.

2.3.1 Inclusion criteria

- Female breast cancer patients who were $\geq$18 years of age.
- Newly diagnosed breast cancer patients: Patients with breast cancer with confirmed histology diagnosed within the year 2023.
- Patients with breast cancer who voluntarily agreed to participate and provided their signatures or initials on the informed consent form.

2.3.2 Exclusion criteria

- Patients with an Eastern Cooperative Oncology Group (ECOG) score of 3 and 4
- Patients with mental or cognitive disorders (e.g., delirium, dementia)

2.4 Sampling methods

Every patient who met the pre-specified inclusion criteria was asked to participate until the desired sample size was achieved.

2.5 Sample size estimation

The Kish and Leslie method was used to establish the sample size based on a descriptive cross-sectional study of breast cancer patients in Ghana, which indicated a prevalence rate for depression of 84.2% (33).

$N = Z^2 (1-P) / \varepsilon^2$

Whereby;

N=Minimum sample

Z=Standard normal deviation of 1.96 (95%CI) is used.

ε = Assumed margin of error of 5%

P = Expected proportion

$N = 1.96^2 * 84.2 (100-84.2)/5^2 = 204$

With consideration of a 10% non-response rate estimated sample size was 224, however, the sample size in this study was 197 due to the time limitation in capturing all participants.

2.6 Variables

The independent variables included socio-demographic and clinical factors.

Sociodemographic factors included age, marital status, employment, education level, health insurance status, living alone, adult care responsibilities, child care responsibilities, and number of children. Clinical factors included disease stage, functional status, treatment modality, plus comorbidities. Prevalence and severity of depression which was assessed using the PHQ-9 tool were the dependent variables.

2.7 Data collection tools

Data was collected by two research assistants who were medical practitioners. The research assistants received two days of orientation on all of the study procedures. The prepared questionnaires had two parts. The first part had socio-demographic and clinical characteristics and the second part had questions adopted from the Patient Health Questionnaire (PHQ-9) that was used to assess the prevalence and severity of depression. This is a self-administered tool however for this study, it was administered by trained research assistants in Swahili form. Before data collection, the tools were piloted on a small number of patients to improve the efficiency and accuracy of the study results. Data was gathered over 4 months using validated and reliable questionnaires.

2.8 Validity and reliability of the PHQ-9

The 9-item PHQ-9 is a self-administered questionnaire derived from the Primary Care Evaluation of Mental Disorders. Total scores can range from one to twenty-seven. In addition, scores can be grouped into minimal (1-4), mild (5-9), moderate (10-14) moderately severe (15-19), and severe depression (20-27) (34). PHQ-9 tool has been used to screen for depression over 2 weeks (34). The PHQ-9 has well-established validity and reliability in patients with cancer (34,35). A valid and reliable translation in Swahili is available for use in this study (34). These factors (ease of use, established validity, reliability in patients with cancer) makes the PHQ-9 tool an appropriate choice for this study. The PHQ-9 reliability coefficient Cronbach's alpha factor was measured and had a good internal consistency (Cronbach α=0.7). The patient's score was calculated and classified as mildly depressed if the score was less than 10 and moderately severely depressed if the score was 10 or more. The cut-off of 10 points has been validated in multiple studies to differentiate between mild and more severe forms of depression (5,36).

2.9 Data management

Before entering the data, the questionnaires were checked for completeness. The information was put into the SPSS Statistical Package for Social Sciences (version 26). A random sample of 197 questionnaires was checked against the SPSS files to confirm the accuracy of data entry.

2.10 Data processes and analyses

Data was analyzed using SPSS. Demographic and clinical data was analyzed using descriptive statistics such as frequencies, percentages, means, and standard deviations. Associations between the independent and dependent variables were analyzed using the Chi-square test, which was employed to compare categorical variables (37). Multivariable analyses (logistic regression) were utilized to examine associations between the independent and dependent variables while controlling for confounders. P values less than 0.05 were considered statistically significant.

2.11 Analysis plan for each specific aim

1. To determine the prevalence of depression in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute between December 2023 and March 2024.

   Total mean PHQ-9 scores and the percentage of patients within each clinically meaningful category for the PHQ-9 were calculated. The prevalence of depression was reported based on these percentages of patients within each of the clinically meaningful categories.

2. To determine the severity of depression in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute between December 2023 and March 2024.

Total mean PHQ-9 scores were calculated and reported as percentages

3. To determine the sociodemographic factors associated with higher depression scores in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute between December 2023 and March 2024.
4. To determine the clinical risk factors associated with higher depression scores in newly diagnosed breast cancer patients treated in Ocean Road Cancer Institute who are assessed between December 2023 and March 2024.

Univariate and Multivariate analysis using logistic regression was used to compare the association between independent and dependent variables and to establish a true relationship between them.

2.12 Plan for dissemination of results

The Muhimbili University of Health and Allied Science (MUHAS) archive will retain a copy of the dissertation for future reference. A manuscript will be submitted for publication. In appreciation for their cooperation in this study, a copy of the paper will be provided to Ocean Road Cancer Institute. The study results will be shared to clinicians and management of the Ocean Road Cancer Institute and presented at scientific meetings, annual research seminars, and conferences.

2.13 Ethical consideration

Ethical approval was obtained from the Institutional Review Board at MUHAS (Muhimbili University of Health and Allied Sciences). Permission to collect data was obtained from Ocean Road Cancer Institute (ORCI). Patients' involvement in this research was voluntary. Everyone who wished to participate was required to provide written informed consent. Each patient’s information and privacy were upheld. Patients could withdraw from the study at any time. To maintain confidentiality, patient-identifying information was not attached to the questionnaires. Data from the interviews was kept in a secure place that only the PI was able to access.

For those patients who experienced distress as a result of the questions and those who had suicidal thoughts or had a score of ≥15 on the PHQ-9, arrangements were made and were referred to an onsite counselor for medical services and counseling.

CHAPTER THREE

3.0 RESULTS

3.1 Baseline Characteristics of the Study Population.

This study recruited 197 newly diagnosed breast cancer patients. The average age was 50.4 (SD=10) years. Many participants were married 67.5% and 84.9% reported living with their husbands. More than half of the patients had a primary level of education 60.4%. A notable percentage of participants were peasants 51.1% and most did not have health insurance 61.4%. The majority of the participants (91.4%) had children and 38.4 % had adult care responsibilities *(Table 1).*

Among the respondents, 12.2% were living with HIV/AIDS. Nearly 73% reported experiencing symptoms, and about 41.1% presented with pain. Regarding the disease's stage, the majority were in Stage II (35%) and Stage III disease (48.7%). The majority of treatment goals were curative 87.8%. Most of the participants (82.2%) received chemotherapy. At the time of the interview, surgical intervention had been performed on 68.5% of the respondents, with the majority 60.4% undergoing modified radical mastectomy (MRM)). Lastly, 26.0% of the respondents had received radiation therapy at the time of interview *(Table 1).*

It was found that 54.8% of newly diagnosed breast cancer patients had depression. Mild depression affected 40% of the population, followed by moderate depression in around 11%, and moderately to severe depression (score >15) in 4% of the population *(Figure 1).* According to the PHQ-9 score in (*Table 3),* feeling tired or having little energy and having poor appetite were the most common symptoms reported with a mean of 0.93 and 0.91 respectively. The least common symptom reported by participants was thoughts that they would be better off dead, or of hurting themselves in some way, with a mean of 0.16.

Table 1: Demographic and Clinical Characteristics of the Sample (n = 197)

Demographic characteristics	
Age	
≤45	71(36.0)
>45	126(63.9)
Age (years, mean (SD))	50.4 (10.4)
Education level (n (%))	
None	20 (10.2)
Primary school	119 (60.4)
Secondary school	42 (21.3)
College/university	16 (8.1)
Marital status	
Single	20 (10.2)
Married	133 (67.5)
Cohabitating	2 (1.0)
Divorced	12 (6.1)
Widow	30 (15.2)
Living arrangements	
With husband	118 (84.9)
With parents	10 (7.2)
Alone	11 (7.9)
Employment status	
Employed	20 (10.9)
Self-employed	62 (33.7)
Unemployed	8 (4.3)
Peasant	94 (51.1)
Health insurance (n (% yes))	76 (38.6)
Have children (n (% yes))	180 (91.4)
Have adult care responsibilities (n (% yes))	76 (38.4)
Clinical Characteristics	
Time since diagnosis (months; mean (SD))	8 (3.6)
Stage of disease (n (%))	
I	8 (4.0)
II	69 (35.0)
III	96 (48.7)
IV	24 (12.2)
Extent of disease (n (%))	
Early	10 (5.1)
Localized	163 (82.7)
Metastatic	24 (12.2)

Intent of treatment (n (%))	
Curative	173 (87.8)
Palliative	24 (12.2)
Had Received surgery at time of interview (n (% yes)	135 (68.5)
Type of surgery (n (%))	
Breast conserving surgery	16 (8.1)
Modified radical mastectomy	119 (60.4)
Received radiation therapy (n (% yes))	51 (26.0)
Received chemotherapy (n (% yes))	162 (82.2)
Type of chemotherapy (n (%))	
Neoadjuvant	60 (30.5)
Adjuvant	87 (53.7)
Palliative	15 (9.3)
Eastern Cooperative Oncology Group score (n (%))	
0	80 (40.6)
1	105 (53.3)
2	12 (6.1)
Concurrent Medical Conditions – n (% yes)	
Human immunodeficiency virus	24 (12.2)
Diabetes	20 (10.2)
Hypertension	52 (26.4)
Cardiac disease	6 (3)
Concurrent symptoms – n (% yes)	
Occurrence of any symptom	143 (72.6)
Pain	81 (41.1)
Fatigue	44 (22.3)
Appetite changes	19 (9.6)
Lymphedema	16 (8.1)

Table 2: PHQ-9 scale and score for depression (n=197)

Symptoms	**Never n (%)**	**Several days n (%)**	**Half of the days or more n (%)**	**Almost every day n (%)**	**Mean**
Little interest or pleasure in doing thing	91 (46.19)	76 (38.58)	14 (7.11)	16 (8.12)	0.77
Feeling down, depressed, or hopeless	117 (59.59)	56 (28.57)	12 (6.12)	11 (5.61)	0.63
Trouble falling or staying asleep, or sleeping too much	127 (64.47)	50 (25.38)	7 (3.55)	13 (6.60)	0.55
Feeling tired or having little energy	62 (31.47)	87 (44.16)	36 (18.27)	12 (6.09)	0.93
Poor appetite or overeating	103 (52.28)	53 (26.90)	23 (11.68)	18 (9.14)	0.91
Feeling bad about yourself	118 (59.90)	50 (25.38)	16 (8.12)	13 (6.60)	0.80
Trouble concentrating on things, such as reading the newspaper	100 (50.76)	87 (44.16)	7 (3.55)	3 (1.52)	0.57
Moving or speaking so slowly that other people could have noticed	152 (77.16)	28 (14.21)	6 (3.05)	11 (5.58)	0.48
Thoughts that you would be better off dead, or of hurting your- self in some way	173 (87.82)	16 (8.12)	8 (4.06)	0	0.16

3.2 Prevalence of Depression

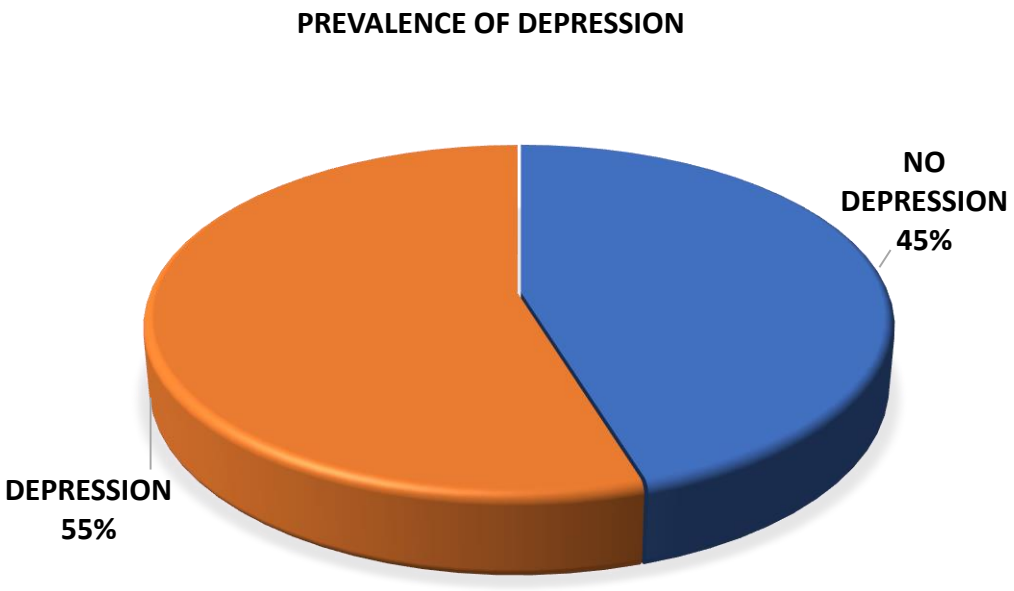


Figure 1: Prevalence of depression in newly diagnosed breast cancer patients attending ORCI (N=197)

Depression was found in (108 cases) 54.8% of the study population and 45.2% had no depression.

3.3 Severity of Depression in newly diagnosed breast cancer patients

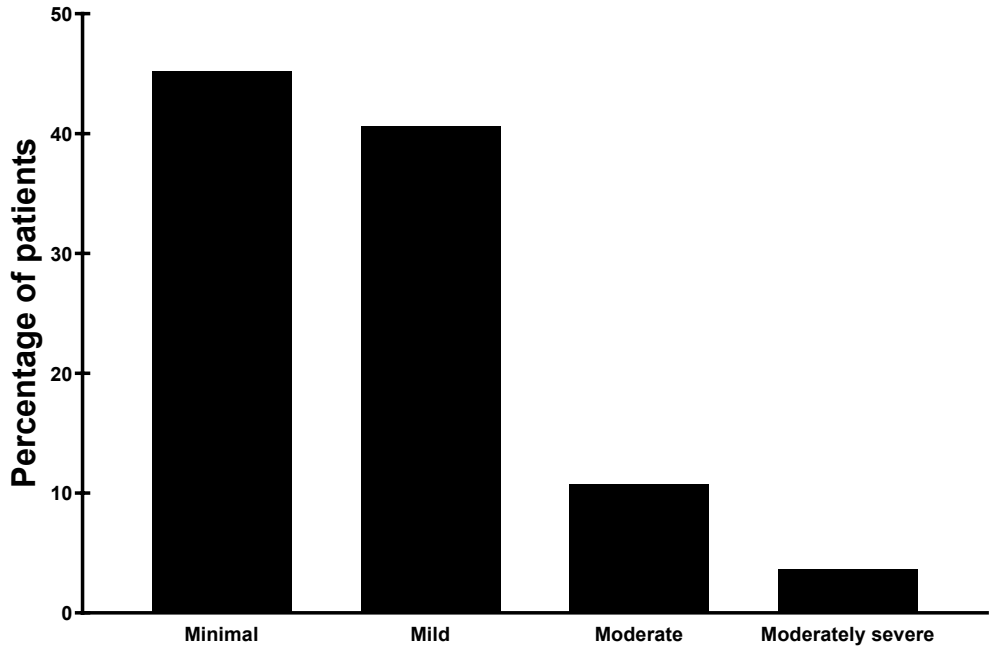


Figure 2: Severity of depression in newly diagnosed breast cancer patients attending ORCI (n=197)

Among 108 patients with depression, 40% had mild depression, 11% had moderate depression and 4% had moderately severe depression.

3.4 Associated factors of Depression in Newly diagnosed Breast cancer patients at ORCI

Multivariate analysis used logistic regression to variables with p-values less than 0.05. Younger age (less than 45 years), advanced stage of the disease, not receiving surgery or radiation, being HIV positive, and experiencing pain were found to be significantly associated with higher scores of depression. Participants less than 45 years old were 2.65 times more likely to experience higher depression scores (95% CI: 1.16-6.06). Patients with stage IV disease were 3.44 times more likely to have higher depression scores than those who had stage I disease (P <0.001). Moreover, patients who had not received surgery at the time of the interview were significantly more likely to experience depression, as were those who had not received radiation therapy. HIV-positive patients were 10 times more likely to

have higher depression scores than HIV-negative patients (P<0.001). Further, patients who presented with pain were 2.81 times more likely to have higher depression scores (P=0.004).

Table 3: Univariate analysis of factors associated with depression among newly diagnosed breast cancer patients treated at ORCI from December 2023 to May 2024.

Variables	Minimal-Mild n (%)	Moderate-Mod Severe n (%)	X^2	P-value
Age				
≤45	34 (48.57)	36 (51.42)	3.68	0.054
>45	79 (62.7)	47 (37.30)		
Level of education				
None	11 (55.00)	9 (45.00)	2.06	0.561
Primary level	73 (61.34)	46 (38.66)		
Secondary level	21 (50.00)	21 (50.00)		
College/University	8 (50.00)	8 (50.00)		
Marital status				
Single	11 (55)	9 (45)		
Married	77 (57.89)	56 (42.10)	2.32	0.717
Cohabiting	2 (100.00)	0 (0.00)		
Divorced	8 (66.67)	4 (33.3)		
Widow	15 (50.00)	15 (50.00)		
Employment status				
Employed	11 (55.00)	9 (45.00)	0.28	0.993
Self employed	35 (56.45)	27 (43.55)		
Unemployed	10 (47.61)	11 (52.38)		
Peasants	54 (57.44)	40 (42.55)		
Health insurance				
Yes	43 (56.57)	33 (43.42)	0.06	0.809
No	70 (57.85)	51 (42.15)		
Have children				
Yes	100 (55.55)	80 (44.44)		
No	13 (76.47)	4 (23.53)	2.71	0.126

Having adult care responsibilities				
Yes	51 (67.11)	25 (32.89)		
No	62 (51.23)	59 (48.76)	4.54	0.033
Stage of disease				
Stage I	4 (50.00)	4 (50.00)		
Stage II	42 (60.87)	27 (39.13)	13.9	0.003
Stage III	61 (63.54)	35 (36.46)		
Stage IV	6 (25.00)	18 (75.00)		
Intent of treatment				
Curative	107 (61.85)	66 (38.15)	9.37	0.002
Palliative	6 (25.00)	18 (75.00)		
Received surgery				
Yes	87 (64.44)	48 (35.56)	8.20	0.004
No	26 (41.94)	36 (58.06)		
Type of surgery				
BCS	11 (68.75)	5 (31.25)	0.79	0.67
MRM	76 (63.87)	43 (36.13)		
Received chemotherapy				
Yes	93 (57.40)	69 (42.60)	0.08	0.778
No	20 (57.14)	15 (42.85)		
Received Radiation				
Yes	37 (72.55)	14 (27.45)	6.27	0.012
No	76 (52.41)	69 (47.59)		
ECOG status				
0	55(68.75)	25 (31.25)		
1	54(51.43)	51 (48.57)	9.18	0.010
2	4 (33.33)	8 (66.67)		

HIV status				
Positive	6 (25.00)	18 (75.00)	11.94	0.001
Negative	107(61.85)	66 (38.15)		
Hypertension				
Yes	31 (59.62)	21 (40.38)	0.11	0.738
No	82 (56.55)	63 (43.45)		
Diabetes				
Yes	12 (60.00)	8 (40.00)	0.05	0.823
No	101(57.06)	76 (42.94)		
Occurrence of any symptom				
Yes	75 (52.45)	68 (47.55)	5.87	0.015
No	39 (72.22)	15 (27.78)		
Pain present				
Yes	39 (48.15)	42 (51.85)	5.11	0.024
No	75 (64.65)	41 (35.34)		

Table 4: Multivariate analysis of factors associated with depression among newly diagnosed breast cancer patients treated at ORCI from May 2023 to May 2024.

Variables	Adjusted OR (95% CI)	P-value
Age		
≤45	2.65 (1.16-6.06)	0.021
>45	ref	
Having adult responsibilities	0.47 (0.19-1.12)	
Yes		0.089
No		
Stage		
I	Ref	
II		
III		0.001
IV	3.44 (1.17-10.10)	
Intent of treatment		
Curative	Ref	
Palliative	0.92 (0.24-3.5)	0.905
Surgery		
Yes	ref	
No	6.11 (2.76-13.56)	<0.001
Received radiation		
Yes	ref	
No	2.35 (1.50-6.77)	0.044
Ecog status		
0	Ref	
1		
2	1.67 (0.39-7.14)	0.49
HIV status		
Positive	10.17 (2.49-41.63)	0.001
Negative	ref	
Occurrence of any Symptoms		
Yes	1.87 (0.55-6.33)	0.316
No	ref	
Pain		
Yes	2.81 (1.40-5.65)	0.004
No	ref	

CHAPTER FOUR

4.0 DISCUSSION

This study was conducted among newly diagnosed breast cancer patients at a Tanzanian tertiary hospital. The primary aim was to determine the prevalence of depression and its associated sociodemographic and clinical factors in this specific population. Most participants in our study had an age above 45 years (62%) with a mean age of 50 years (SD =10.4) and 67.5% were married. These demographic characteristics are comparable to those observed in a study conducted in Rwanda (10), where the majority of participants 73% were married and had an average age of 52 years. The majority of our participants had stage II (35%) and III (48.7%) disease which is similar to findings from a study conducted in Ethiopia(28), which highlights the commonality of late-stage presentation among breast cancer patients. Pain and fatigue were the two leading symptoms reported in our study. This is similar to a study done by Thakur et al (11), where they reported that pain and fatigue were the most experienced symptoms by the patients with a prevalence of about 80%, and are associated with an increased risk for depression. According to PHQ-9, (*table 2)*; feeling tired and poor appetite were the most reported symptoms. This is in contrast to a study conducted in Palestine which reported sleep disturbances as the most prevalent symptom ((5), this disparity may be attributed to the complex social and political environment in Palestine.

Our study found that 54.8% of newly diagnosed patients experienced depression, a prevalence higher than in the general population (18). This finding supports the notion that cancer patients particularly those with breast cancer are at increased risk of depression ((18). Our results are consistent with existing literature, which suggests that cancer patients are more susceptible to depression, especially within the first year following diagnosis (18). Similarly, a study conducted in Ethiopia reported a similar prevalence among breast cancer patients at 58% ((9), while a study in Rwanda found an even higher prevalence of 67.7% (10). This highlights the widespread nature of depression among breast cancer patients across different regions. However, our study findings are significantly higher than previously reported rates in other studies. For example, a study in Iran reported a depression rate of 21%(4) while a study in India found a rate of 11% ((15). These discrepancies may be

due to different study populations, diagnostic criteria, or timing of depression assessment (13). Our findings highlight the critical need for routine depression screening and early intervention especially for women with breast cancer. Women with breast cancer often struggle to accept a breast cancer diagnosis, grappling with the illness's uncertainty and fearing the worst outcomes ((15). Our findings highlight the critical need for routine depression screening and early intervention especially for women with breast cancer. The higher prevalence rates in this study underscore the urgent need for targeted psychiatric support in oncology, particularly in less developed regions and among women, as has been previously suggested ((16).

Among those with depression, 80 had mild depression 40%, 21 had moderate depression 11%, and 7 had moderately severe depression 4%. Our study highlights the substantial prevalence of depression with a significant proportion experiencing mild to moderate depression. Consistent patterns of mild to moderate depression being the most common have been found in other studies such as a study conducted in Jordan (38), which reported a prevalence of 30.2% with 26% experiencing mild symptoms, 19.5% moderate symptoms and 1.8% severe levels of depression. Similarly, a Malaysian study ((15), found 6% of the patients with mild depression, 7% with moderate and 8% with moderately severe to severe depression. These discrepancies may be explained by differences in the research populations' demographics, the cancer stage at the time of assessment, cultural contexts, the instruments used for the evaluation, and the particular social and psychological support networks that are accessible in various nations ((16).

One notable sociodemographic finding from our study is the higher depression severity among younger patients. This observation is consistent with findings from studies conducted in Malaysia and Palestine, where younger cancer patients exhibited higher levels of depression compared to their older counterparts ((39)(5)). Compared to older women, 10% to 32% of younger patients who are diagnosed with breast cancer develop depression more frequently. The possible explanations are that younger patients may face unique stressors such as concerns about their career disruption, future family planning, and social isolation, which can contribute to higher levels of depression ((28). They might also have less experience with coping strategies compared to older patients who might have developed better resilience over time ((28). Our study found no significant relationship between

education, employment, marital status, and higher depression scores. This is in line with a study conducted in Sri Lanka ((31), which suggests that these factors may not play a critical role in influencing depression. Our study also found no significant association between having children or having adult care responsibilities and depression severity. This might reflect the presence of strong familial and community support systems that alleviate the psychological burden of caregiving in our study population.

In this study, patients with metastatic breast cancer were found to experience higher levels of depression compared to those with early-stage disease. This is similar to findings from a study conducted in Kazakhstan ((30), which demonstrated that more advanced stages of cancer are associated with an increased risk of depression. In addition, another study ((9), reported similar findings where patients who had stage IV disease were 4.5 times more likely to develop depression than those with stage I disease. This is because patients with distant metastasis have a higher symptom burden that is attributable to chronic inflammation, and these physiological effects may increase the risk of depression ((31). Several other factors could also contribute, the psychological stress from the chronicity of the illness and the limited treatment options for these stages, and the poorer prognosis. Moreover, a higher percentage of patients who did not undergo surgical intervention experienced moderate to severe depression. This could also be explained by the fact that surgery is linked to a more proactive course of care and the potential for recovery. However, this is contrary to a study done ((26), in which those patients who had undergone surgery had higher rates of depressive symptoms.

This study also found that patients who did not undergo radiation therapy had higher rates of depression compared to those who did. This shows that radiation treatment may help patients feel less depressed, possibly because it helps control symptoms and enhances overall prognosis, which lessens part of the psychological burden brought on by the illness. Moreover, HIV-positive patients were 10 times more likely to have higher depression scores than those who tested negative (P=0.001). This was consistent with a systematic review ((18,40), which showed higher depression rates among HIV patients, the reasons being the psychological burden of living with a chronic illness and also the related stigma and discrimination that these patients seem to face. Pain was found to be significantly associated with higher depression scores in our study. Mathew Bair et al’s research (41) provides a

crucial insight into this connection, revealing that over 65% of patients experiencing pain also suffer from depression. This statistic underscores the prevalence of comorbid pain and depression, highlighting the need for integrated treatment strategies. He suggests that the intensity and persistence of pain can directly influence the severity of depressive symptoms (41). Patients with chronic pain often face limitations in their daily activities, which can lead to feelings of helplessness, hopelessness, and diminished self-worth, all of which are core components of depression.

CHAPTER FIVE

5.0 LIMITATION, CONCLUSION AND RECOMMENDATIONS

5.1 Limitation

Being cross-sectional in nature, this study involves a single-point-in-time assessment, which may not adequately capture the full range of depression symptoms that patients experience throughout their illness. This limitation also restricts our ability to evaluate the long-term impact of depression on cancer outcomes.

5.2 Conclusion

The observed prevalence of depression in this study adds to the body of evidence indicating that depression is a significant and prevalent issue among breast cancer patients and that it can easily go unnoticed. This indicates that there is a need for oncologists to discuss mental health issues with their patients and enable early recognition and interventions. The significance of taking into account physical symptoms, particularly pain, and giving special consideration to younger patients, patients living with HIV/AIDS, and those with advanced disease stages should be emphasized in comprehensive cancer care strategies meant to reduce depression and enhance overall quality of life throughout the cancer journey.

5.3 Recommendation

1. Screening and treatment should be incorporated into routine oncology care using standardized screening instruments, such as the Patient Health Questionnaire-9 (PHQ-9). It should be used by oncologists at critical junctures of treatment care from diagnosis, therapy, and follow-up appointments.
2. Psycho-oncologists should actively be engaged in multidisciplinary oncology teams to create integrated care that address both the psychological and physical needs of cancer patients. This collaboration can lead to improved patient outcomes.
3. Young patients, those with advanced diseases, those awaiting surgery and radiotherapy, and people living with HIV should be offered counseling and support that can assist them in navigating the psychological effects of their illness.

4. Healthcare providers should develop personalized pain management strategies for patients presenting with pain. Psycho-oncologists can play a key role in assessing the psychological dimensions of pain and ensuring treatment addresses both aspects of pain.
5. To establish peer navigator programs where trained survivors or patients with similar experience guide newly diagnosed patients. This will offer support, guidance and practical advice on what to expect during treatment.

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APPENDICES

Appendix IA: Data collection tool

Depression and its associated risk factors in newly diagnosed breast cancer patients treated at Ocean Road Cancer Institute in Tanzania.

SN	QUESTIONS	ANSWERS
A: PATIENT PARTICULARS		
1	Study number	
2	Hospital Identification number	
3	Enrollment date (day/month/year)	
4	Study site	
B: SOCIAL-DEMOGRAPHIC CHARACTERISTICS		
5	Age (years)	…….
6	Are you married?	a) Yes b) Not married c) Cohabiting d) Divorced e) Widow
7	Level of education	a) None b) Primary level c) Secondary level d) University
8	Medical insurance	a) Y e s b) N o
9	Employment status/Source of income	a) Farming b) Self-employed

		c) Employed d) Unemployed e) Others…….
10	Do you live with anyone?	a) No one/Alone b) Husband c) Parents d) Others…
11	Adult care responsibility	a) Yes b) No
12	Do you have any children?	a) Yes b) No
13	If Yes, how many?	
C: CLINICAL CHARACTERISTICS		
14	HIV/AIDS	a) Positive b) Negative
15	Other comorbidities Diabetes	a) Yes b) No
16	Hypertension	a) Yes b) No
17	Cardiac/ Heart disease	a) Yes b) No
18	Renal disease	a) Yes b) No
19	Current symptoms	a) None b) Pain c) Fatigue d) Changes in appetite or weight e) Lymph edema f) Others……

20	Stage of the disease	a) Stage I b) Stage II c) Stage III d) Stage IV
21	Disease extent	a) Early b) Locally advanced c) Distance Metastasis
22	Date of diagnosis (dd/mo/yr)	
23	ECOG status 0- Full active, asymptomatic 1- Symptomatic, Full ambulatory 2- Symptomatic, In bed <50% of the day	
24	Treatment intent	a) Curative b) Palliative
25	Chemotherapy received	a) Yes b) No
26	If Yes	a) Neo-adjuvant chemo
		b) Adjuvant chemo
		c) Palliative chemo
27	Surgery	a) Yes b) No
28	Type of surgery	a) Breast Conserving Surgery b) Modified Radical Mastectomy
29	Radiation	a) Yes b) No

Appendix IB: Data collection Tool: Swahili Version

NO.	MASWALI	MAJIBU
SEHEMU A: UTAMBULISHO WA MGONJWA		
1.	Nambari ya utafiti	
2.	Nambari ya usajili ya hospitali	
3.	Tarehe ya mahojiano	
4.	Sehemu	
SEHEMU B: SIFA ZA KIDEMOGRAFIA NA KIJAMII		
5	Umri (kwa miaka)	…….
6	Je umeolewa?	a) Ndio b) Sijaolewa c) Naishi na mtu d) Tumeachana/talaka e) Mjane
7	Kiwango chako cha juu cha elimu?	a) Sijaenda shule b) Elimu ya msingi c) Elimu ya sekondari d) Elimu ya chuo
8	Je una Bima ya afya?	a) Ndiyo b) Hapana
9	Hali ya ajira	a) Mkulima b) Nimejiajiri c) Nimeajiriwa d) Sijaajiriwa e) Mengineyo…..
10	Unaishi na nani?	a) Siishi na mtu b) Mume

		c) Wazazi d) Mengineyo……..
11	Una jukumu la kutunza watu wazima?	a) Ndiyo b) Hapana
12	Je una watoto?	a) Ndiyo b) Hapana
13	Kama Ndiyo, wangapi?	
SEHEMU C: SIFA ZA KITIBA		
14	Hali ya Virusi vya Ukimwi (VVU)	a) Chanya kwa VVU b) Hasi kwa VVU
15	Magonjwa mengine ya kudumu Kisukari	a) Ndiyo b) Hapana
16	Shinikizo la damu	a) Ndiyo b) Hapana
17	Magonjwa ya moyo	a) Ndiyo b) Hapana
18	Magonjwa ya figo	a) Ndiyo b) Hapana
19	Dalili za sasa	a) Hakuna b) Maumivu c) Uchovu d) Mabadiliko katika hamu ya kula au uzito e) Limfedema/kuvimba mkono wa sehemu ilioathirika f) Mengineyo ……..
20	Hatua ya ugonjwa	a) I b) II c) III

		d) IV
21	Kina cha ugonjwa	a) Awali (Early) b) Katikati (Locally advanced) c) Juu Zaidi/ Ugonjwa uliosambaa (Distance Metastasis)
22	Tarehe ya uchunguzi (tarehe/mwezi/mwaka)	
23	Hali ya ECOG 0- Bila dalili na kuwa katika hali nzuri kabisa 1- Mwenye dalili, na anaweza shughuli za kujitunza. 2- Mwenye dalili na yuko kitandani kwa chini ya asilimia 50 kwa siku	
24	Nia ya matibabu	a) Tiba b) Tiba ya kupunguza dalili ya Ugonjwa
25	Umepata tibakemia?	a) Ndiyo b) Hapana
26	Kama ndiyo	d) Tibakemia kabla
		e) Tibakemia baada
		f) Tiba kemia kwa ajili ya kupunguza dalili (Palliative)
27	Umefanyiwa upasuaji?	a) Ndiyo b) Hapana
28	Aina ya upasuaji	a) Breast Conserving Surgery b) Modified Radical Mastectomy
29	Umepata mionzi?	a) Ndiyo b) Hapana

Appendix IIA: Patient Health Questionnaire-9 (PHQ-9) English Version

Over the last 2 weeks, how often have you been bothered by any of the following problems? (Use "✓" to indicate your answer)	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

CODING: _____ + _____ + _____ + _____

=Total Score: _____

Total score	Depression severity
1-4	Minimal/No depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe
20-27	Severe depression

Appendix IIB: Patient Health Questionnaire-9 (PHQ-9) Swahili version

MASWALI YA AFYA YA MGONJWA				
Katika kipindi cha wiki mbili zilizopita, ni mara ngapi unasumbuliwa na matatizo yafuatayo? (weka alama √ kuonyesha jibu lako)	Hapana kabisa	Siku kadhaa	Zaidi ya nusu ya siku hizi	Karibu kila siku
1. Kutokuwa na hamu au kukosa raha kufanya vitu	0	1	2	3
2. Kujisikia kama huwezi kuchangamka, kusikia huzuni au kukosa tumaini	0	1	2	3
3. Tatizo kupata usingizi au tatizo kuendelea kulala baada ya usingizi ama kulala kupita kiasi	0	1	2	3
4. Kujisikia kuchoka au kuwa na nguvu kidogo	0	1	2	3
5. Kutokua na hamu ya kula au kula kupita kiasi	0	1	2	3
6. Kusikia vibaya kuhusu binafsi au kusikia kama umeshindwa au umejishusha ama umeshusha chini familia yako	0	1	2	3
7. Tatizo kutuliza akili kwenye vitu kama kusoma gazeti au kusikiliza redio	0	1	2	3
8. Kusogea au kuzumgumza pole pole sana hata ingeweza kuonekana kwa watu wengine. Ama kinyume kuwa na mashaka/wasiwasi au kutotulia kiasi hata umekuwa ukitembea tembea sana kuliko kawaida	0	1	2	3
9. Fikiria kwamba ni heri ukifa, au fikira za kujiumiza kwa njia fulani	0	1	2	3

Appendix IIIA: Consent Forms English Version

Serial No……

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES (MUHAS)

THE STUDY INFORMED CONSENT FORM.

Introduction

I am Queen Godfrey Tarimo, a postgraduate student at Muhimbili University of Health and Allied Sciences, Dar es Salaam. I will be researching depression and its associated risk factors among newly diagnosed breast cancer patients attending Ocean Road Cancer Institute. I'm going to tell you about this study and invite you to take part. Before making a decision, you can talk about the study with anybody you feel comfortable with.

The goal of the study

The objective of this study is to determine the prevalence of depression and its associated risk factors among newly diagnosed breast cancer patients receiving treatment at Ocean Road Cancer Institute.

What exactly does participation entail?

Suppose you agree to participate in the study, you will be given questions using a data collection tool and information on your socio-demographics, clinical characteristics, and treatment options will be recorded as well as data from a depression assessment tool. Whether or not you choose to participate in this study is entirely up to you. You might later change your mind and decide not to participate, even if you initially agreed.

Privacy:

Personal data will be collected for the research confidentially and only the researchers will have access to it. No names, only identification numbers will be used.

Potential risk: Participating in this study has no risk for you.

Benefits:

Determination of the prevalence and severity of depression in our local setting as well as factors that are associated with it thus will enable us to be vigilant, anticipate, and prevent its occurrence in turn improving quality of life.

Please get in touch with any of the following if you have any issues about your legal rights as a study participant.

Dr. QUEEN GODFREY TARIMO
Email address: queen.julieth93@gmail.com
Phone number: 0715 068855

Dr. NAZIMA DHARSEE
Email address: njdharsee@gmail.com
Phone number: 0689 605123

Dr. CHRISTINA VALLEN MALICHEWE
Email address: christinamalichewe@gmail.com
Phone number: 0622 554276

Dr. BRUNO SUNGUYA
Director of Research and Publication (MUHAS)
Email address: sunguya@gmail.com
Phone number: +255 685 217272

Patient's declaration:

Having read and comprehended the information above, I……. hereby give my agreement to take part in this study.

Signature:

…….

If unable to sign, leave a thumbprint:



Appendix IIIB: Consent Forms Swahili Version

Namba ya kushiriki ……

CHUO KIKUU CHA AFYA CHA MUHIMBILI

FOMU YA RIDHA YA KUSHIRIKI KATIKA HUU UTAFITI.

Utambulisho

Naitwa Dkt Queen Godfrey Tarimo, ni mwanafunzi wa shahada ya uzamili katika chuo kikuu cha Muhimbili, Dar es salaam. Utafiti wangu unahusu uwepo wa ugonjwa wa sonona na mambo yanayohusiana nayo miongoni mwa wagonjwa wenye saratani ya matiti wanaotibiwa katika Taasisi ya Saratani ya Ocean Road. Nitakuelezea kuhusu utafiti huu na kukuomba kushiriki. Kabla ya kufanya maamuzi unaweza kujadiliana na mtu yeyote unayejisikia upo huru nae.

Dhumuni

Lengo kubwa la huu utafiti ni kutambua kuhusu uwepo wa ugonjwa wa sonona na mambo yanayohusiana nayo miongoni mwa wagonjwa wenye saratani ya matiti wanaotibiwa katika Taasisi ya Saratani ya Ocean Road.

Namna ya kushiriki

Ukikubali kushiriki katika tafiti hii utapewa maswali kwa kutumia zana za kukusanyia data na maelezo kuhusu demographia ya kijamii, sifa za kitiba na aina ya tiba yatarekodiwa pamoja na maswali kutoka katika zana ya kupima uwepo wa ugonjwa wa sonona. Kushiriki katika huu utafiti ni juu yako kabisa na waweza kubadili mawazo na kukataa kuwa katika huu utafitii hata kama ulikubali awali.

Usiri:

Taarifa zako za kibinafsi zitazokusanywa kwa ajili ya utafiti zitawekwa faragha na watafiti pekee ndio wataweza kuzifikia. Utambulisho wa nambari tu badala ya majina utatumika.

Utafiti huu una madhara gani?

Utafiti huu hautakuwa na madhara yoyote kwako.

Utafiti huu una faida gani?

Kuelewa uwepo na ukali wa ugonjwa wa sonona na mambo yahusiana na kutokea kwa sonana hivyo kusaidia kutambukua macho na dalili zake mapema ilikuzuia kutokea na hivyo kuboresha maisha.

Tafadhali wasiliana na yeyote kati ya wafuatao ikiwemo utakuwa na swali lolote kuhusu haki yako kama mshiriki katika utafiti huu:

Dr. QUEEN GODFREY TARIMO
Barua pepe: queen.julieth93@gmail.com
Namba ya simu: 0715 068855

Dr. CHRISTINA VALLEN MALICHEWE
Barua pepe: christinamalichewe@gmail.com
Namba ya simu: 0622 554276

Dr. NAZIMA DHARSEE
Barua pepe: njdharsee@gmail.com
Namba ya simu: 0689 605 123

Dr. BRUNO SUNGUYA
Director of Research and Publication (MUHAS)
Barua pepe: sunguya@gmail.com
Namba ya simu: +255 685 217272

RIDHAA:

Nimesoma na kuelewa taarifa hapo juu, Mimi …… ninakubali kushiriki katika huu utafiti.

Sahii yako:

…….

Iwapo huwez kutia sahii, tumia dole gumba:



Appendix IV: Ethical Clearance



Ref. No.DA.282/298/01.C/ 1997 Date: 19/12/2023

MUHAS-REC-12-2023-1997
QUEEN GODFREY TARIMO
College of Medicine MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: PREVALENCE OF DEPRESSION AND ASSOCIATED RISK FACTORS IN NEWLY DIAGNOSED BREAST CANCER PATIENTS TREATED AT OCEAN ROAD CANCER INSTITUTE

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.
APPROVAL DATE: 19/12/2023
EXPIRATION DATE OF APPROVAL: 19/12/2024

STUDY DESCRIPTION: Purpose:
The purpose of this cross-sectional observational study is to determine the Prevalence of Depression and associated Risk Factors in Newly Diagnosed Breast Cancer Patients treated at Ocean Road Cancer Institute between December 2023 and March 2024.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided:
https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2015134.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.



Dr. Nahya Salim Masoud,
Chairperson, MUHAS Research and Ethics Committee

Appendix V: Introduction letter

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE STUDIES

In reply quote;
Ref. No. HD/MUH/T.25/2021

05th July, 2024

THE EXECUTIVE DIRECTOR,
OCEAN ROAD CANCER INSTITUTE,
P.O.BOX 3592,
DAR ES SALAAM.

RE: INTRODUCTION LETTER OF QUEEN GODFREY TARIMO

We would like to inform you that the carrier of this letter is Queen Godfrey Tarimo with registration number HD/MUH/T.25/2021 a student in the College of Medicine at Muhimbili University of Health and Allied Science (MUHAS), pursuing MMed. Clinical Oncology.

As part of her studies, she will be doing an elective research titled **"Prevalence of Depression and Associated Risk Factors in Newly Diagnosed Breast Cancer Patients Treated at Ocean Road Cancer Institute".** She is being supervised by Dr. Christina Malichewe from MUHAS and Dr. Nazima Dharsea from ORCI.

The Ethical Clearance for doing the said research has been given by the University.

Kindly request your assistance and cooperation to our student.

Yours Sincerely,

Mr. Sebe Mohamed
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Queen Godfrey Tarimo

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz